

DERWENT-ACC-NO: 2001-182234

DERWENT-WEEK: 200118

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TITLE: Fine pitch placement of solder spheres on components of assembly by moving solder spheres relative to stencil, pouring off remainder of solder spheres, removing the stencil and frame from base, and heating the components

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PATENT-FAMILY:

PUB-NO	PUB-DATE	LANGUAGE
PAGES	MAIN-IPC	
US 6191022 B1	February 20, 2001	N/A
008	H01L 021/44	

INT-CL (IPC): B23K031/00; H01L021/44 ; H01L021/48 ; H01L021/50

ABSTRACTED-PUB-NO: US 6191022B

BASIC-ABSTRACT: NOVELTY - Fine pitch solder spheres are placed on components of an assembly by inserting the components into pockets in a base; aligning a stencil with the base; introducing solder spheres into the stencil and its frame; moving the solder spheres relative to the stencil; pouring off a remainder of the solder spheres; removing the stencil and frame from the base; and heating the components.

DETAILED DESCRIPTION - Fine pitch placement of solder spheres on components of an assembly by inserting the components into pockets in a base (210); aligning a stencil (234) with the base; introducing solder spheres into the stencil and its frame; moving the solder spheres relative to the stencil; pouring off a remainder of the solder spheres; removing the stencil and frame from the base; and heating the components. The stencil has holes. The frame to which the

stencil is attached has elevated walls. The frame and the base are mechanically keyed to orient and physically engage together in a single, precise position. The stencil is aligned with the base by engaging the frame firmly in contact with the base to rigidly position the stencil relative to the frame so that the stencil is vertically above the base by a precise, repeatable distance. The elevated walls extend vertically from the stencil. The solder spheres are moved relative to the stencil to pass a subset of the solder spheres through the stencil into position adjacent the components. The remainder of the solder spheres that are not part of the subset of the solder spheres are poured off the stencil through a gate (240) in the frame. The components are heated to adhere the subset of the solder spheres. INDEPENDENT CLAIMS are also included for (A) a guide for locating solder balls relative to sub-assemblies; and (B) an apparatus for precisely and repeatably dispensing solder spheres on the components. The guide comprises holder (220) for holding and locating the sub-assemblies; hopper for receiving and transiently holding the balls; stencil for selectively dispensing the balls on the sub-assemblies in a precise geometry; and gate through which the balls from the hopper may pass while the stencil maintains the dispensed balls on the sub-assemblies.

USE - For fine pitch placement of solder spheres into components of an assembly.

ADVANTAGE - The invention reliably and repeatably forms interconnections between components or sub-assemblies and electrical circuits. It also forms interconnections easily and simply, with a minimum of tooling and equipment

expense. It enables these interconnections to be used for any of the variety of soldering techniques, and does not limit the interconnections to only one or few of the applications available to solder sphere attachment.

DESCRIPTION OF DRAWING(S) - The figure shows the guide.

Base 210

Holder 220

Stencil 234

Gate 240

L Number	Hits	Search Text	DB	Time stamp
11	1	"conductor spheres" and placement	USPAT; US-PGPUB; EPO; JPO; DERWENT; IBM_TDB	2002/11/05 12:25
12	0	"conductor spheres" and stencil and hopper	USPAT; US-PGPUB; EPO; JPO; DERWENT; IBM_TDB	2002/11/05 12:25
13	0	"conductor ball" and stencil and hopper	USPAT; US-PGPUB; EPO; JPO; DERWENT; IBM_TDB	2002/11/05 12:26
14	9	solder and ball and stencil and hopper	USPAT; US-PGPUB; EPO; JPO; DERWENT; IBM_TDB	2002/11/05 12:41
15	42	stencil and hopper and ball	USPAT; US-PGPUB; EPO; JPO; DERWENT; IBM_TDB	2002/11/05 12:41
16	2	("4256532" "5880017").PN.	USPAT	2002/11/05 12:45
17	35	("3621564" "3645392" "3719981" "4119480" "4311267" "4722470" "4752027" "4825034" "4914814" "5024372" "5057969" "5118027" "5133495" "5145104" "5196726" "5203075" "5219117" "5261155" "5261593" "5275970" "5341564" "5346118" "5388327" "5468681" "5492266" "5539333" "5542601" "5545465" "5564617" "5586715" "5597469" "5607099" "5623506" "5643831" "5658827").PN.	USPAT	2002/11/05 12:47
18	12	("3569607" "4412642" "4655164" "4914814" "5024372" "5039628" "5211328" "5268068" "5372295" "5480835" "5536677" "5539153").PN.	USPAT	2002/11/05 12:49